

**REASONABLY AVAILABLE CONTROL MEASURES (RACM) ANALYSIS
FOR THE DALLAS/FORT WORTH OZONE NONATTAINMENT AREA**

U.S. Environmental Protection Agency
Region 6, Dallas, Texas

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RACM ANALYSIS FOR DALLAS/FORT WORTH

This paper provides supplemental information on whether all Reasonably Available Control Measures (RACM) have been adopted in the Dallas/Fort Worth area.

SUMMARY

EPA has performed an analysis to evaluate emission levels of oxides of nitrogen (NO_x) and volatile organic compounds (VOC) and their relationships to the application of current and anticipated control measures expected to be implemented in the DFW nonattainment area.

Section 172(c)(1) of the Act requires SIPs to provide for the implementation of all reasonably available control measures (RACM) as expeditiously as practicable and for attainment of the standard. EPA has previously provided guidance interpreting the RACM requirements of 172(c)(1) in the General Preamble. See 57 FR 13498, 13560. In the General Preamble, EPA indicated its interpretation of section 172(c)(1), under the 1990 Amendments, as imposing a duty on States to consider all available control measures and to adopt and implement such measures as are reasonably available for implementation in the particular nonattainment area. EPA also retained its pre-1990 interpretation of the RACM provisions that where measures that might in fact be available for implementation in the nonattainment area could not be implemented on a schedule that would advance the date for attainment in the area, EPA would not consider it reasonable to require implementation of such measures. EPA indicated that a State could reject certain measures as not reasonably available for various reasons related to local conditions. A State could include area-specific reasons for rejecting a measure as RACM such as the rejected measure would not advance the attainment date, or technological and economic feasibility in the area.

The EPA also issued a recent memorandum reaffirming its position on this topic, "Guidance on the Reasonably Available Control Measures (RACM) Requirement and Attainment Demonstration Submissions for Ozone Nonattainment Areas." John S. Seitz, Director, Office of Air Quality Planning and Standards, dated November 30, 1999. A copy can be obtained from www.epa.gov/ttn/oarpg/t1pgm.html. In this memoranda, EPA states that in order to determine whether a state has adopted all RACM necessary for attainment and as expeditiously as practicable, the state will need to provide a justification as to why measures within the arena of potential reasonable measures have not been adopted. The justification would need to support that a measure was not reasonably available for that area and could be based on technological or economic grounds.

EPA has reviewed the SIP submittal for the DFW area and believes that the State did not include sufficient documentation concerning the rejection of certain available measures as RACM for the specific DFW area. Therefore, EPA has itself reviewed potential available measures, as documented in this TSD. Based on this analysis, EPA proposes to conclude that this additional set of evaluated measures are not reasonably available for the specific DFW area, because (a) some would require an intensive and costly effort for numerous small area sources, (b) DFW would need further reductions from sources already regulated, or about to be regulated to advance the attainment date, (c) since the DFW area relies in part on reductions from the upwind Houston/Galveston (HGA) area, and upwind attainment areas in the eastern half of Texas which are substantial, and the reductions projected to be achieved by the evaluated additional set of measures are relatively small, they would not produce emission reductions sufficient to advance the attainment date in the DFW area and, therefore, should not be considered RACM.

EPA reached this conclusion primarily because the reductions expected to be achieved by the potential RACM measures are relatively small, in the range of 1 ton per day of VOC and 4.0 tons per day of NO_x. These potential reductions are far less than the emissions reductions needed within the nonattainment area to reach attainment and the measures to reach attainment will not be achieved until the attainment year.

In addition, the DFW attainment demonstration relies, in part, on emission reductions from outside the nonattainment area to reach attainment. These include controls on utility boilers in the Eastern portion of Texas scheduled to take effect in May 2003. They also include controls on mobile sources in the counties surrounding the DFW area that will take effect in Eastern half of Texas. These East Texas Low RVP are scheduled to take effect in May 2000. I/M is scheduled to take effect in May 2003. Also, EPA has concluded that emission reductions in the Houston area are necessary for the DFW area to timely attain. These needed emission reductions will not be fully realized until 2007.

The attainment demonstration for the DFW area indicates substantial emission reductions are needed within the DFW area. It also indicates that the ozone benefit expected to be achieved from regional NO_x and VOC reductions is substantial. Reductions in the Houston area are also needed for timely attainment. Therefore, EPA concludes, based on the available documentation, that since the reductions from potential RACM measures do not nearly equate to the reductions needed within the DFW area to demonstrate attainment, none of these unadopted measures could advance the attainment date prior to full implementation of the emission reductions in the DFW area and the measures in the Houston area.

Although EPA encourages areas to implement available RACM measures as potentially cost-effective methods to achieve emissions reductions in the short term, EPA does not believe that section 172(c)(1) requires implementation of potential RACM measures that either require costly

implementation efforts or produce relatively small emissions reductions that will not be sufficient to allow the DFW area to achieve attainment in advance of full implementation of all other required measures.

MOBILE SOURCE ANALYSIS

Attachment 1 is an analysis of a broad range of transportation control measures (TCMs) to determine if they are RACM for the DFW area. Emission reductions that might result from implementation of these TCMs were derived from on-road emissions and vehicles miles of travel (VMT) data in the attainment year emissions inventory for the DFW nonattainment area.

Table 1 (Attachment 1.A.) shows attainment year on-road emissions for volatile organic compounds (VOC) and nitrogen oxides (NOx) in tons per day (TPD) in column 3. Light-duty cars and light-duty trucks generally contribute 80% of the on-road VOC inventory, and 70% of the on-road NOx inventory. For the purpose of this analysis, EPA assumes that only light-duty cars and light-duty trucks are affected by the TCMs. Column 4 shows the on-road VOC inventory and NOx inventory reduced by 20% and 30% respectively to account for this assumption. The light-duty vehicle VOC and NOx inventory for the DFW nonattainment area is divided by the average daily attainment year VMT (shown in column 5) for the area, to calculate emissions in daily tons per mile (shown in column 6).

Table 2 (Attachment 1.B) shows a range of emissions reductions that could potentially be achieved through the implementation of TCMs in the DFW area. Column 1 shows a range of TCMs, widely recognized by the literature, grouped into seven broad categories. The literature also contains estimates of reductions in VMT that could be expected from implementation of these TCMs. The VMT reductions vary in magnitude, depending on the scope and scale of the TCMs, the number of years over which the effects are analyzed, the existing transportation infrastructure and demand management (i.e. existing TCMs) in the area, development patterns, and a number of other economic and demographic characteristics. It is important to note that in the United States, empirical evidence of the travel activity effects of TCMs have come primarily from case studies of small scale TCM programs, and that estimates of larger effects have come from studies of theoretical programs for which there is little actual large scale implementation experience. The high range of VMT reductions, as the result of scenarios which may require fundamental changes in infrastructure investment policies, or in the case of “Smart Growth” measures, governmental and other institutional relationships, may, in reality be very difficult to achieve within the timeframe for demonstrating attainment.

Nevertheless, Column 2 of Table 2 shows the range of VMT reductions by percent of total regional VMT, that could occur as a result of TCM implementation according to the literature. By multiplying the attainment year daily VMT (Table 1, Column 5) for the DFW area, by the range of VMT reductions by percent, one can estimate the range of VMT reduced in the DFW

area for each category of TCMs. Column 3, shows this range of daily VMT reduced for each category. The figures in Column 4 show the range of estimated emission reductions in tons per day (TPD). These estimates were calculated by multiplying the emissions, in daily tons per mile (Table 1, Column 6), by the range of daily VMT reduced for each category of TCMs.

Thus, in the DFW area implementation of all TCMs listed could potentially achieve emission reductions in the range of 1.728 - 21.492 tons/day(tpd) of VOC and 2.103 - 26.157 tpd of NO_x. The midpoint of these ranges are 11.6 and 14.1 tpd, respectively.

However, TCMs are incorporated in the DFW SIP as a NO_x control measure showing 4.7 tons per day reductions of NO_x as a local initiative for credit. The SIP also commits sufficient additional TCMs to backup the Voluntary Mobile Emission Program, if needed. Although the reductions are not quantified, we assume them to be equal to the maximum VMEP reductions, which are 5.0 tons per day of NO_x. Therefore, the total TCMs in the SIP, either for credit or reserved to backup the VMEP is 10.1 tons per day of NO_x. This leaves only a potential of 4 tons per day of NO_x which is a small percent of the reductions needed for attainment. The SIP did not expressly show VOC reductions since it focuses on NO_x controls; therefore, there is no specification of the VOC reductions from TCMs. However, it is reasonable to assume that the proportion of VOC reductions to NO_x reductions documented in the SIP (47 tpd/181tpd = .26) would indicate that a VOC potential of only 1.0 tpd (4.0 x .26) would be available as potential VOC reductions. This is a very small percent of the reductions needed for attainment.

Table 1 (located at the end of this report) compares the estimated emission reductions from TCMs for the DFW area to the emission reductions necessary to demonstrate attainment. Row 2 shows the total emission reduction needed to demonstrate attainment. Row 3 shows the midpoint of the range of potential emission reductions available from TCMs. Row 5 shows the estimated emission reductions as a percent of the total reduction needed to demonstrate attainment. The EPA believes it is appropriate to use these figures for the purpose of this analysis, given the wide range of potential emission reduction cited in the literature. As noted above, the emission reductions on the high end of the range, are based on theoretical programs, which would require implementation on a scale and scope unlikely to be manageable within the timeframe for reaching attainment. The literature and implementation experience in urban areas leads EPA to believe that the low to midpoint range of emission reductions are achievable with careful planning, adequate implementation resources, aggressive public information programs and a sustained commitment by the implementing agencies. Using the midpoint of the range of emission reductions provides a liberal estimate of potential reductions from TCMs, to compare against the emission reductions required to demonstrate attainment.

When compared to emission reductions necessary for attainment, emission reductions from the additional TCMs that could potentially be implemented are only a small percentage of emission reductions needed. From this analysis, EPA concludes that implementation of these TCMs

would not produce emission reductions sufficient to advance the attainment date without obtaining further reductions from sources already regulated, or about to be regulated.

An additional mobile source measure, Inspection and Maintenance, is already in place in the DFW area. The current approved SIP covers two counties. The attainment demonstration SIP submittal expands the program from two to nine counties (the four Consolidated Metropolitan Statistical Area counties plus five surrounding counties). The program has also been strengthened to include Acceleration Simulation Mode (ASM) testing. This program achieves emission reductions that are within 90% of the emission reductions from I/M 240 the most stringent I/M program at less than half the cost/testing lane. Thus, we conclude that the State has applied RACM for the Inspection/Maintenance program.

Further, for off-road emissions, States are generally pre-empted from setting emission standards for off-road mobile sources. States can put in place use restrictions which Texas has employed for construction equipment in the DFW area, for example. These restrictions have been challenged in court and have not been tried in other areas. After considering local feasibility and economic impact of additional use restrictions, we determine that further measures of this type are not RACM.

STATIONARY SOURCE ANALYSIS

Major Sources:

NOx Major Sources:

Texas submitted its NOx RACT rules for the Dallas/Fort Worth Area in March 16, 1999 which EPA approved on September 1, 2000. In their submission Texas included the following summary of the contribution of point source emissions:

<u>Source Category</u>	<u>% of point source inventory</u>
Utility Emissions	91%
Industrial/Comm./Inst. Boilers	3-4%
Reciprocating Engines	3%
Gas Turbines/other	2%

Texas imposed RACT on all of these categories. Furthermore, Texas has adopted rules to further control emissions from Utility boilers and Reciprocating Engines. RACT is defined by EPA as the lowest emission rate achievable considering economic and technical feasibility. RACT level control is generally considered RACM for major sources. In the case of NOx

controls in Dallas, TNRCC is controlling emissions beyond levels that EPA as previously approved as RACT for such utility and industrial boilers.

VOC Major Sources:

Attachment 2 is an analysis provided by the State in 1993 of major sources in the ozone nonattainment areas in Texas. The report shows the current (as of 1993) rules that apply to each source and their emissions, the future rules that were to be implemented and listed control technique guidelines (CTGs) that were expected to be issued by the EPA. The analysis shows that, at that time, the majority of sources were already covered by TNRCC rules. Since this analysis, DFW was bumped up to serious lowering the threshold to 50 tons/year. This meant that a number of sources needed to be controlled that weren't previously controlled. To address this issue, Texas revised its offset lithography rules and bakery rules. With these rules Texas has now addressed all of its major sources in the DFW area with RACT rules. Of the sources not shown as controlled in the 1993 analysis, the majority are printing and packaging operations now covered by the revised printing/lithography rules. It should be noted that Surgikos has shut down its manufacturing operations and its emissions have been removed from the Emissions Inventory. Dallas AT&T is an electronic manufacturing company whose emissions are covered by TNRCC's degreasing and vent gas rules that EPA approved as meeting RACT. Thus, EPA concludes based on the information available, Texas has implemented RACT on all major stationary sources of VOC in the DFW area. RACT is defined by EPA as the lowest achievable emission rate considering technical and economic feasibility and is therefore considered RACM for major sources.

Area Sources:

VOC area sources:

In Attachment 3, categories and their emissions were identified based on 1998 information from the National Emissions Trends data base. The remaining source categories were then ranked on the basis of emissions by category. The bottom 20 percent of the categories were removed from consideration based on the assumption that their individual category contribution would be considered too small and too numerous to regulate individually, and therefore would not be considered reasonably available. The emissions from top 80 percent of the categories were then totaled. The total emissions from the top 80% of the categories total to about 122 tons/day of "potentially controllable" emissions. In previous RACM analyses, the EPA has assumed a generalized level of control (50%) applied to each of these categories. Even though approximately 81 percent control was generally assumed to be a default level of control for previous Control Techniques Guidelines for VOC in the past, those CTG's were developed for categories that were more readily controlled. For this RACM analysis, EPA has assumed the lower amount (50 percent) for remaining categories, since controls may not be quite as effective

or as readily available. This results in “potentially available emission reductions” of 61 tons/day.

The 61 tons/day of potentially available VOC emission reductions is, however, overstated in the DFW case. The above analysis did not account for some of the specific requirements that Texas already has adopted for the DFW area. In the DFW area, emissions from the top 80% of the categories that were assumed to be uncontrolled include the following:

1. Solvent utilization - surface coating category: Includes industrial adhesives and coatings that are already controlled under TNRCC’s miscellaneous metal parts and products coating rules that were developed pursuant to EPA’s control technique guideline and apply to small sources that emit as low as 3 lbs/hour or 15 lbs/day. (115.421-115.429)
2. Solvent utilization - nonindustrial coatings category: Includes cutback asphalt which is already controlled in the DFW area by TNRCC’s rules. (115.510-115.519) The category also includes consumer solvents that are already being controlled by national rules.
3. Waste disposal/recycling - landfills category: Controlled by State rule (30 TAC 115.152,153, 155-157, 159)
4. Storage and transport - Service station, Stage II category: Controlled by State rule (30 TAC 115.241.249).

Excluding the above categories since they are already controlled in the DFW area, leaves zero tons day of potentially controllable emissions.

NOx Area Sources:

NOx area sources are smaller and more numerous than the VOC area sources. Requiring NOx controls on these sources would therefore likely require an intensive, costly effort. Also, as noted in EPA’s final rule on the NOx SIP call:

“Area Sources. In the NPR, EPA noted that control levels for area sources (i.e., sources other than mobile or point sources) could not be determined based on available information concerning applicable control technologies. Comments to the NPR did not identify specific NOx control technologies that were both technologically feasible and highly cost-effective. Because EPA has no new information on applicable control technologies for area sources, no additional control level is assumed for these sources in this rulemaking. (63 FR 57402, October 27, 1998.)”

As a result, controls on these categories are not considered reasonably available.

It should be noted that Texas has adopted rules to control emissions from new residential water heaters and small boilers sold throughout the State of Texas so NO_x area sources have not been left completely uncontrolled.

SUMMARY

The following Table summarizes the results of EPA's analysis.

Table 1. Summary of Potential VOC and NOx Reductions for DFW

	Oxides of Nitrogen (TPD)	Volatile Organic Compounds (TPD)
Reductions Needed for Attainment	181	48
Potential Mobile Source measures	4	1
Potential Stationary Source Measures	0	0
% of Needed Emission Reductions from additional potential measures	2.2%	2.1%

Texas has concluded from its modeling analysis, and we agree, that NOx emission reductions in DFW are the most effective way to reduce ozone. An additional 2.2% emission reduction in NOx would not accelerate attainment of the ozone standard because some of the local reductions will not achieve their full reductions until the attainment year. In particular, the Federal Tier II motor vehicle control program, the heavy duty diesel standard will not achieve all of the emission reductions relied upon until the attainment year. Until these emission reductions are in place, Dallas/Fort Worth will not attain the standard. DFW would need reductions from sources already regulated, or about to be regulated to reach attainment. Additional measures could not individually advance the attainment date. EPA also does not believe that the additional VOC emission reductions are large enough to advance the attainment date for the same reasons as cited for NOx. Particularly, since in the DFW area, VOC reductions are not as effective as NOx in reducing ozone, and further local VOC reductions in this area would not produce significant ozone reductions in the DFW area.

Furthermore, as shown in the modeled attainment demonstration, the DFW area relies upon emission reductions in central and east Texas and the upwind Houston area. Since the Houston area has an attainment date of 2007, it is unlikely that all the emission reductions necessary to

bring the DFW area into attainment will be obtained until 2007. Thus there are no other reasonably available measures that could advance the attainment date.

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RACM ANALYSIS FOR DALLAS/FORT WORTH

ATTACHMENT 1

RACM ANALYSIS FOR DALLAS/FORT WORTH

ATTACHMENT 2

RACM ANALYSIS FOR DALLAS/FORT WORTH

ATTACHMENT 3